mended that strength, flexibility and coordination training should be a part of any exercise prescription.

Strength training is exercise that increases muscular strength. Low-weight, high-repetition strength exercises for general fitness are now recommended. Low-weight, high-repetition exercises are exercises that can be done for 10 to 15 repetitions using free weights or machines before the onset of muscular fatigue. The advantage of low-weight, high-repetition exercise is that it is nearly as effective as high-weight, low-repetition exercise (exercise where muscular fatigue sets in with only a few repetitions) in strength gain, but it does not predispose to significantly high elevations in blood pressure, as does high-weight, low-repetition exercise.

Flexibility training, or muscle stretching before and after exercise, has been much discussed but little studied. A systematic stretching program ten minutes before and after exercise, however, is recommended as part of every exercise prescription.

Coordination training is conceptually the most complex part of exercise prescription. Globally, it is the practice of sports-specific techniques that enhance neuromuscular coordination with the goal to prevent injury. Charles Henning, MD, Clinical Associate Professor of Orthopedics at the School of Medicine, University of Kansas Medical Center, has data showing that a series of practice techniques has decreased the incidence of anterior cruciate ligament injuries in school athletics in his community. Teaching athletes how to fall safely, decelerate, pivot and change direction while running are examples of Henning's techniques.

The "fitness boom" is a popular trend in American culture. Many family physicians are being called upon by patients to "prescribe exercise." Exercise prescription should include aerobic, strength, flexibility and coordination training techniques. Consequently, family physicians need to know that exercise prescription, when properly given, will lead to the long-term goals of promoting health and preventing injuries.

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Ultrasound in Obstetrics—Safety Considerations

ULTRASOUND has become so commonplace in obstetrical practice that it is almost routine. The 1984 consensus statement of the National Institutes of Health listed 27 indications for diagnostic ultrasound imaging in pregnancy. With the use of Doppler ultrasound to detect fetal heart tones, imaging ultrasound and ultrasonic devices for external fetal monitoring, most pregnant women will have multiple exposures to ultrasound. Many pregnant women wonder whether ultrasound is completely safe in pregnancy, and some refuse its use based on a fear of risk to the infant.

The bioeffects of ultrasound have been extensively studied. Ultrasound energy can cause tissue damage by two known mechanisms—heat and cavitation. The intensity of ultrasound required to cause these effects in humans is not achieved in commercially available devices used in pregnancy. Also, most of the ultrasound-produced heat is absorbed by a mother's tissues and does not reach the fetus. Hence, after analyzing experiments on ultrasound effects, the National Counsel on Radiation Protection has reported that currently available imaging and Doppler ultrasound devices are safe in pregnancy.

Some authors still express caution about the indiscriminate use of ultrasound in pregnancy. They state that all possible biologic effects may not be known and that a large enough epidemiologic study to detect injury in 1 in 5,000 infants (the estimated chance of leukemia in a fetus exposed to x-rays) has not been done. Such uncertainty prompts the International Childbirth Education Association to request that informed consent be given by pregnant women before exposure to ultrasound. While a formal procedure for consent may not be necessary, physicians should discuss the use of ultrasound with their patients and limit its usage to situations in which the information obtained is important in managing the pregnancy.

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Maternal Serum α-Fetoprotein Screening

A RECENT CALIFORNIA LAW, administered by the Department of Health Services, mandates all prenatal care providers to offer maternal serum α-fetoprotein (MS-AFP) testing, with appropriate informed consent, to all patients during the 15th to 20th week of gestation. This law reflects the acceptance of many authorities of the MS-AFP test as a well-established screen for certain birth defects and it parallels an official recommendation by the American College of Obstetricians and Gynecologists. It therefore seems prudent that all family physicians practicing obstetrics understand the basic premises, limits and implications of MS-AFP screening.

Neural tube defects occur in about one in every thousand live births and are the cause of fetal and infant death and serious handicaps in survivors. Prenatal diagnosis by amniocentesis and elective abortion for expectant mothers with a known family history of neural tube defects have been available for years and are based on leakage of AFP through the open fetal defect. Of infants with such defects, however, 90% to 95% are the first affected child in a family; therefore, the discovery that AFP could be measured in maternal serum led to a simpler screen.

A large number of prospective studies have shown high sensitivity (95%) for anencephaly and slightly lower sensitivity (70% to 75%) for open spina bifida. In addition, a recent discovery that lowered levels of MS-AFP are correlated with the Down syndrome (20% to 40% sensitivity) now allows screening for women younger than 35 years.

Despite its high sensitivity for neural tube defects, the MS-AFP test has a very poor specificity because it is esti-